that the two are one and the same people; that a great number of these ancient monuments were built at the time of the discovery of America by the Europeans and subsequent to it; and that the archæological districts, as determined by the investigations of the mounds and other ancient works and remains, conform, to a certain extent, to the localities of the tribes or groups of cognate Indian tribes at the time of the discovery. Conclusions on early migrations of Indian tribes can only be drawn to a limited extent. The publication of the general report, which may be expected within a few years, will contain the material from which these important conclusions have been drawn.

INDIAN BASKETRY.—The annual report of the National Museum for 1884 contains several interesting ethnological papers. Prof. O. T. Mason gives a sketch of the basketry of North American aborigines, which is amply illustrated with drawings of specimens and enlarged portions of the basket-work, in order to illustrate exactly the manner of weaving. Mason discusses the methods in use all along the coast of western America from the Arctic Ocean to California, in the interior, and among the tribes of the Atlantic coast, and distinguishes three types of basketry, which he calls the twined, the coiled, and the woven ones. The first is most frequently found on the north-west coast. Coiled basket-work is almost exclusively used by the northern Tinne and by the Apache, while many tribes apply all methods of manufacture. A great difficulty in determining the areas of characteristic forms is encountered through the deficiency of the methods of many collectors, and the fragmentary state of collections; many specimens which are seemingly characteristic of one tribe having in reality a far wider distribution, while other characteristic types are wanting in the collections.

OF THE ESKIMOS.—There are two other papers of the same character in the National Museum report for 1884,— one by the same author, on Eskimo throwing-sticks; and one by Mr. John Murdoch, on bows of the western Eskimo. The standpoint from which these subjects have been treated is the same as the one indicated above. A list of the specimens upon which these studies are founded, such as is attached to Professor Mason's paper, ought not to be omitted in publications of this kind, and the fact that it is wanting detracts somewhat from the value of Mr. Murdoch's interesting paper. It is necessary for the reader to know how many specimens of each locality were studied in order to form a judgment as to how far the difference in form may be typical or accidental.

A MYTH OF THE OKINAGEN INDIANS.—Mr. A. S. Gatschet publishes an interesting myth of the Okinagen Indians in the *Globus*. He relates how the animals climbed on a chain of arrows to heaven in order to obtain the fire. The bird Tskan made a strong bow of the rib of an elk which he killed by eating its heart. Then he killed the *coyote* with his arrows, but the latter was revived by the fox. Then he shot one arrow into the sky. The next arrow he shot stuck in the end of the first one. Thus he continued until a chain was formed reaching from heaven to earth. All animals climbed up this chain, and the beaver obtained the fire. An analysis of this interesting legend shows that its elements are found among a great number of tribes of Selish lineage and among their neighbors, but it seems that the myth of the ascent to heaven is characteristic of Selish mythology. Gatschet tries to interpret this legend, and thinks the bird Tskan represents the moon, the *coyote* the sun; but this seems improbable, as the myth is extremely complicated, and is probably derived from a great number of sources. It is desirable that the mythology of the native tribes of the upper Columbia should be collected systematically, for the analysis of tradition is one of the most important methods of studying the history of the native races and the psychology of nations.

BOOK-REVIEWS.

Synopsis of the Flora of the Laramie Group. (Extract from the Sixth Annual Report of the U. S. Geol. Surv.) By LESTER F. WARD. Washington, Government. 4°.

THIS synopsis is published in advance of the completion of the author's great monograph on the Laramie flora, and is a timely and important contribution to our knowledge of the thousands of feet of debatable strata between the Cretaceous and Tertiary. The literature of the Laramie group is already large and widely scattered, and Mr. Ward has conferred a boon upon future students of this formation by his clear and comprehensive review of previous researches and opinions.

The Laramie group is described as an extensive, brackish-water deposit, situated on both sides of the Rocky Mountains, and extending from Mexico far into the British North American territory, having a breadth of hundreds of miles, and representing some 4,000 feet in thickness of strata. When this deposit was made, an immense inland sea must have existed, whose waters occupied the territory now covered by the Rocky Mountains. These waters were partially cut off from the ocean by intervening land areas, through which, however, one or more outlets existed, communicating with the open sea at that time occupying the territory of the Lower Mississippi and Lower Rio Grande valleys. That this great inland sea spread over this entire territory, is not at all disproved by the absence of Laramie strata from large parts of it, since these parts are situated, in most cases, in mountainous regions where the upper strata might be expected to have been generally eroded away.

This Laramie sea existed during an immense period of time, and was finally but very gradually drained by the elevation of its bed, through nearly the middle of which, longitudinally, the Rocky Mountains and Black Hills now run. The exceeding slowness of this event is shown by the fact, so clearly brought out by Dr. White, that the marine forms of the Fox Hills strata, as they gradually found themselves surrounded by a less and less saline medium on the rising of the intervening land area, had time to become transformed and adapted to brackish-water existence, while these new-formed brackish-water species, when the sea at length became a chain of fresh-water lakes, had time again to take on the characters necessary to fresh-water life.

Dr. White recognizes the fact that the upheaval of the strata that formed the bottom of this sea took place, not in one uniform process of elevation, but in a prolonged series of rhythmic fluctuations of level, whose algebraic sum constituted at length a mountain uplift. But the numerous coal-seams, one above another, that characterize the greater part of these beds, and equally the successive deposits of vegetable remains at different horizons, speak even more eloquently than any animal remains can, of the oscillatory history of the bed of this sheet of water.

There may have been, and doubtless were, many islands scattered over the surface of this sea in Laramie time, and the evidence generally warrants us in assuming that a low, level country surrounded the sea, with marshy and swampy tracts. The islands and shores were heavily wooded with timber that can be as certainly known in its general character as we can know the timber of our present forests. But that for the greater part of the Laramie period there also existed at no great distance a large amount of elevated land, there can be no doubt. The deposits are chiefly siliceous in the southern districts, and argillaceous in the northern, but the nature of their deposition points unmistakably to the existence of large and turbulent rivers, that fell into the quiet sea and brought down from areas of rapid erosion immense quantities of silt corresponding to the nature of the country over which they flowed in their course. Where these elevated sources of this abundant detritus were located is one of the great problems for the present and future geologists to work out.

The author points out that the apparent impossibility of referring the Laramie group to either the Cretaceous or the Tertiary is not the fault of the investigators, but of the facts; for the real disagreement is in the organic forms and the nature of the deposits, so that omniscience itself could never harmonize them with the forms and deposits of other parts of the world: in other words, the Laramie fauna and flora have been developed under physical conditions so nearly unique that it is extremely improbable that they obtained elsewhere on the globe at the same time. And even supposing such a coincidence possible, if the Laramie invertebrate forms are the modified descendants of antecedent marine forms, there is no probability that the conditions at any other point on the earth's surface could be so nearly identical with those obtaining there, that precisely the same modifications would take place to adapt the marine forms to the brackish-water habitat. The chances are therefore infinity to one against the existence of other beds that shall

contain an invertebrate fauna identical with that of the Laramie group.

With regard to vertebrate remains, this objection does not apply; and, could they be made to harmonize with themselves, they might, perhaps, be trusted to some extent as indices of synchronism in widely separated localities. But, as shown by Cope, they do not thus agree, for the Laramie forms include genera that are regarded as characteristic of Cretaceous, and others that are regarded as characteristic of Tertiary strata. This should surprise no one. The law that has been laid down by paleontologists, that the same epochs in geologic time produced the same living forms, is contrary to the now well-established principles of geographical distribution, according to which the earth is subdivided into a large number of faunal areas more or less clearly marked off one from another.

The peculiarity of this principle, which is of most importance to paleontology, is that these territorial subdivisions represent faunas not merely different from one another, but showing different degrees of biologic development as development is supposed to have gone on in the animal kingdom. Every one knows that the fauna of Australia belongs to an undeveloped type, being marsupial in aspect so far as its mammals are concerned. The types of South America are lower than those of North America, and the latter lower than those of Asia and Europe. If all the present faunas of the globe were buried under its soil, it is clear that it would not only be impossible to harmonize the deposits of different continents, but that the inference now freely drawn by paleontologists, that the less developed forms demonstrate their existence at earlier epochs, would lead to grave mistakes and be generally false. New Zealand is now in its age of birds, while the Galapagos Islands are still in that of reptiles, or the mesozoic age.

The difficulties in the way of geological synchronism arising from the geographical distribution of organisms are not lessened when we pass from the vertebrate fauna to the flora of the Laramie group; for, taking the present flora of the globe as a criterion, we find that the geographical distribution of plants is more uneven than that of animals. Floral realms are more numerous and distinct than faunal realms; and the more serious obstacle, that some areas furnish types representing less developed floras than others, exists here, as in the case of animals. The proteaceous and myrtaceous flora of Australia may be regarded as rudely corresponding to its marsupial fauna. Hence, although the vegetable fossils of the Laramie group are especially remarkable for their great abundance and variety, Mr. Ward concedes that the age of the Laramie group cannot be proved by its flora alone.

The more particular comparison and discussion of the Upper Cretaceous or Senonian, Laramie, and Eocene floras is introduced by a table covering 72 pages, and giving the geographical and stratigraphical distribution of every authentic species from these formations. The discussion concludes with the statement that the Laramie flora as closely resembles the Senonian flora as it does either the Eocene or the Miocene flora. But this does not necessarily prove either the Cretaceous age of the Laramie group or its simultaneous deposit with any of the Upper Cretaceous beds. The laws of variation and geographical distribution forbid us to make any such sweeping deductions. With regard to the first point, it is wholly immaterial whether we call the Laramie Cretaceous or Tertiary, so long as we correctly understand its relations to the beds below and above it. We know that the strata immediately beneath are recognized Upper Cretaceous, and we equally know that the strata above are recognized Lower Tertiary. Whether this great intermediate deposit be known as Cretaceous or Tertiary is therefore merely a question of a name, and its decision one way or another cannot advance our knowledge in the least.

The synopsis concludes with notes on the various localities where the Laramie plants were collected, and 35 double plates, with 139 figures.

Types of the Laramie Flora. (U.S. Geol. Surv., Bull. No. 37.) By LESTER F. WARD. Washington, Government. 8°.

THIS rather bulky bulletin is supplementary to the preceding synopsis. The 139 figures are reproduced on 57 octavo plates, and are accompanied by critical comments, and descriptions of the new genera and species.

NOTES AND NEWS.

ON Tuesday the 20th, in the presence of the secretary of the navy, the naval committee of the House of Representatives, and many representatives of the army and navy of this and other countries, an exhibition was given in New York Bay of the destructive capabilities of the Zalinski pneumatic dynamite gun. The results of the tests made at the time prove conclusively, that, with the present experimental and necessarily imperfect gun, a shell containing fifty-five pounds of explosive gelatine may be thrown with accuracy a distance of one mile, and exploded at the proper moment for producing the maximum of destructive effect. The target used was the two-masted schooner 'Silliman,' eighty tons' burden, late of the United States Coast Survey, but recently condemned, and reserved to be used in torpedo experimenting. She was anchored 1,980 yards from Fort Lafayette, where the gun was stationed. After two trial-shots with blank cartridges, a loaded shell was fired, which struck the water a few yards short of the target. The explosion threw a column of water nearly a hundred feet into the air, and the concussion jarred the vessel so that the mainmast was broken off a few feet above the deck. The next shot struck the vessel at or below the water-line, with an instantaneously destructive result. The schooner was lifted up, fairly torn apart amidships, and the rails were under water in less than thirty seconds, only the foremast and its standing rigging being left in view. All around this floated small fragments of the schooner. In each of these instances the gelatine was exploded by percussion in this way: a small electric battery was affixed to the side, the only thing lacking to start its operation being moisture. A thin piece of blotting-paper kept this out. When the shell was immersed, the moisture admitted generated sufficient electricity to fire a detonator of fulminate of mercury, which exploded the gelatine.

— R. Nahrwoldt has made a series of experiments on the gradual loss of electricity of electrified bodies (*Naturw. Rundschau*, ii. No. 35). In an essay published in 1878 the author proved that the discharge takes place by means of the particles of dust suspended in the air. These are electrified and then repelled from the electrifying body. The result of these experiments led Lodge and Von Obermayer to their method of clearing rooms from smoke. Later on, it was shown that a wire of platina made red-hot by electricity electrified the surrounding air, although it was almost free of dust. For this reason Nahrwoldt resumed his experiments. He found that electricity was discharged through a point only in dusty air. He made his experiments in an air-tight glass shade the sides of which were covered with a thin layer of glycerine. After the dust was precipitated on the sides of the glass through the action of the electricity, the discharge was very slight. As soon as a wire of platina was electrified, and became red-hot, electricity was again discharged through the point. Nahrwoldt concluded that this was due to particles flying from the red-hot wire. This conclusion was proved to be correct by the occurrence of platina in the deposits on the sides, and by the loss of weight of the wire. These experiments led him to the conclusion that air free of dust cannot be electrified statically.

— We learn that the pecuniary loss attending the publication of the *Zoologischer Jahresbericht* has been so great as to make it necessary henceforth to restrict the scope of the work. Systematics and faunistics are to be excluded. The *Jahresbericht* is published under the able editorial supervision of Dr. Paul Mayer of the Naples Zoölogical Station, and has now reached its eighth year. Four heavy volumes have hitherto been issued each year, giving accurate and comprehensive summaries of all the zoölogical work done during the year under review. The *Jahresbericht* is one of the most difficult, most expensive, and at the same time most valuable, zoölogical serials ever undertaken. About thirty reporters (*Referenten*), distributed among different countries, have been employed in collecting, summarizing, and arranging this vast work. The task has been faithfully and most thoroughly accomplished, and we most earnestly hope that the number of subscribers may be at once increased to an extent that will insure its continuance on the same broad plan that has hitherto been followed. The *Jahresbericht* has become our *vade-mecum*; and we can but regard it as a serious misfortune to have its scope narrowed. Are earnest zoölogists in this country willing to see such a work as this interrupted for